Proposed Synopsis on

"Design, Novel Synthesis and Biological evaluation of Fused Heterocycle system containing an Oxindole precursor and development of Synthetic method"

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स्वामी रामानंद तीर्थ मराठवाडा विद्यापीठ, नांदेड

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By

Mr. Dnyanadeo J. Kesarkar
(Research Scholar)

Under the Guidance of
Dr. Baliram S. Hote
(Assistant Professor)
Department of Chemistry
Maharashtra Udayagiri Mahavidyalaya Udgir Latur - 413517

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Design, Novel Synthesis and Biological evaluation of Fused Heterocycle system containing an Oxindole precursor and development of Synthetic method.

Choice of topic with reasoning

Heterocyclic compound have wide range of application. They are predominantly use in pharmaceutical, agrochemical and veterinary product. They also find applications as sanitizers developers, antioxidants, corrosion inhibitors, copolymers, dyestuff. More than 90% of new drugs contain heterocycles and the interface between chemistry and biology, at which so much new scientific insight, discovery, and application is taking place is crossed by heterocyclic compounds. This review article covers the most active heterocycles that have shown considerable biological actions such as antibiotic, antifungal, anti-inflammatory, antiviral, anticancer, anticonvulsant, anthelmintic, antihistamine, antidepressant, xanthine oxidase inhibitor activities.

Large number monocyclic, bicyclic, 5, 6 and 7 membered heterocyclic rings as an important part of their structure. Such compounds include alkaloids, flavonoids, coumarins and terpenoids are widely used as medicines. N and S containing heterocycles are the most extensively synthesized and screened compounds it found to exhibit diverse pharmacological activities such as anesthetic, anticancer, antifungal, anti-inflammatory, xanthine oxidase inhibitor, hypnotic, anti-diabetic, anti-ulcer, ophthalmic activity.

Imidazole, pyrazole, thiazole, tetrazole, oxindole, indole, oxazole, quinoline, thiophene and benzodizipines nuclei are important structures present in numerous synthetic and natural compounds and have wide applications in medicinal chemistry. All this active compounds prepared according to literature by proper modification in process as well as in functional group of API. Thus the proposed work involves synthesis of heterocyclic compounds containing above nuclei with appropriate substituent on it.

An overview of the relevant literature

The term “heterocycle” defined as cyclic compound having at least two different elemental. Over the past year significant amount of research activities for synthesized novel five and six membered heterocyclic compounds and methodologies for environmentally benign process for

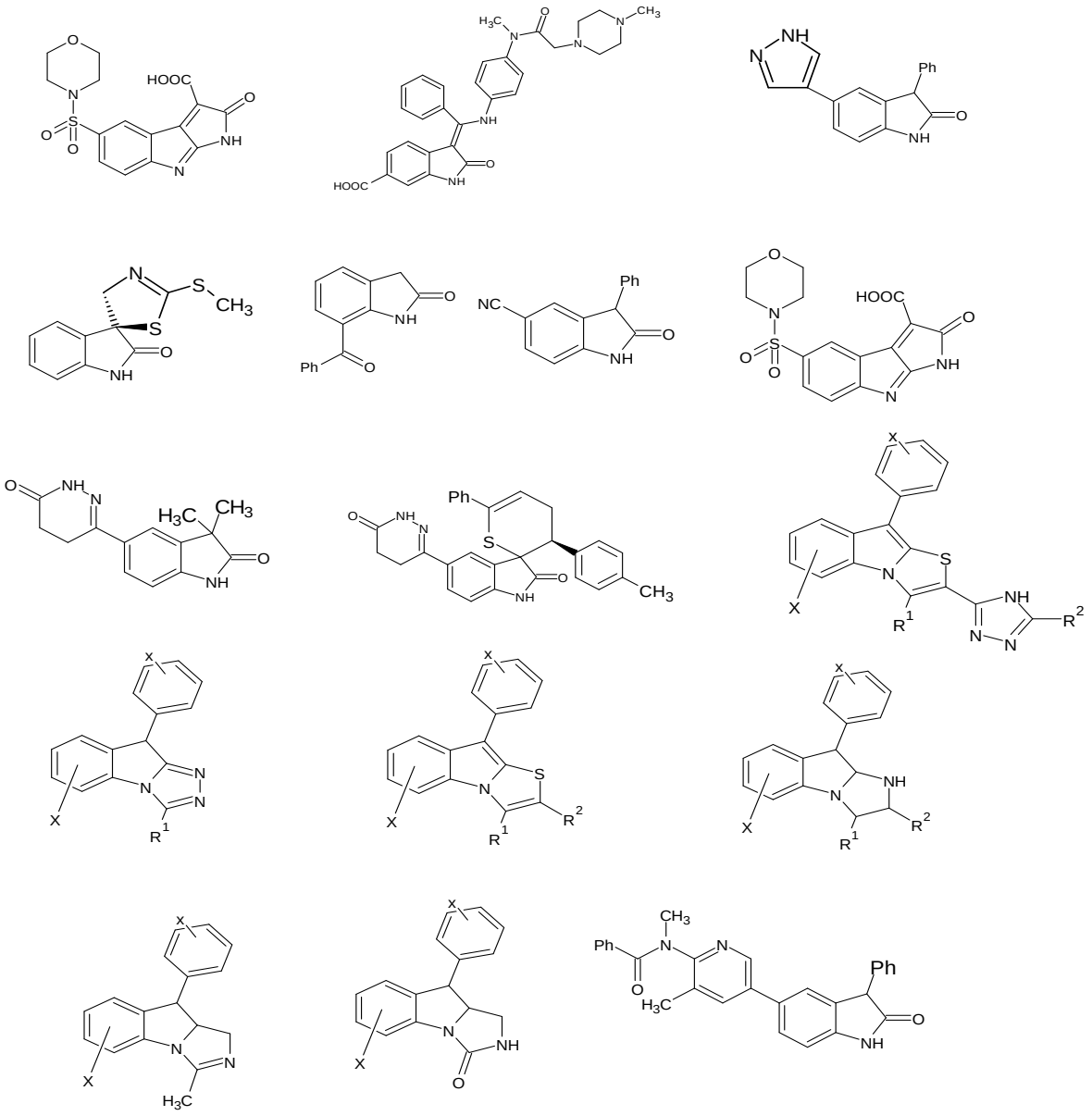
pharmaceutical and their intermediate that have efficient protocol for no environmental risk and economically feasible. As part of this research work, the significant effort was directed towards new methodologies to develop green multi component synthesis by using and heterogeneous catalyst for organic transformation, single electron transformation, organometallic chiral ligand catalyst, oxidative ring opening. In this context, we have aim to synthesis of novel heterocyclic compound with proper understand the biological activities.

The methodology

All the heterocyclic compounds will be prepared by modified process found in the literature and characterization of them with the help of IR, NMR and mass spectroscopic technique. Purification and analysis by instrumental such as Flash chromatography, Preparative HPLC HPLC, GC and Polarimetry. All the novel compound will be evaluated for their biological activities towards antifungal, anti-inflammatory, xanthine oxidase inhibitor, hypnotic, anti-diabetic ,anti-ulcer ,ophthalmic activity, CNS Stimulants,

Submission of data to international and national reputed journal for publication of research work.

Following privileged structure under consideration.



Statement of hypothesis

Initially, the synthesis and purification of required heterocyclic molecule will be made using the reported literature method. The compound containing pyrazol, tetrazole, thiazole and benzodiazepine received considerable attention in recent years due to their wide range of physiological activities.

The wide application of these heterocyclic compounds in pharmaceutical industries have promoted us to work on their synthesis. The tetrazole, pyrazole and tetrazole group is superior in terms of metabolic stability, bioavailability and heterocyclic ring can create a greater charge distribution. As part of this program synthesis of novel heterocyclic compound and green methodologies, C-C cross coupling using metal ligand catalyst in presence of ionic liquid

Therefore, in the proposed research work, we have plan to synthesize some biologically active important heterocyclic molecules. These molecules screened for various biological activities viz antimicrobial, antifungal, anti-inflammatory, anesthetic, anti convualsants, CNS stimulants, anticancer, anti-diabetic, xanthine oxidase inhibitor etc.

Proposed work plan

With the background, we plan to synthesis of novel synthetic methods containing oxindole and fused heterocyclic compound bearing both electron donating and electron withdrawing substituents, and explore biological potential.

Literature review and synthesis novel oxindole, thiazole (Year I)

In the present work define new heterocyclic compound from one pot synthesis of substituted aniline and a-hydroxy aryl/alkyl AcOH by intramolecular cyclization using SPPS catalyst followed by thizole formation.

Synthesis of triazolo indole, imidazolo indole (Year II)

The synthesis of fused novel triazolo indole and imidazolo indole from oxindole by using silica supported catalyst, sulfide catalyst.

Study of Physiochemical properties and Biological evolution (Year III)

The study of physical properties of synthesized novel heterocyclic compound such as solubility, XRD, viscosity, density. The study of molecular modeling, docking of newly synthesized heterocyclic compounds are to screened by their biological activity like anti- cancer, anti-oxidant, muscle relaxant, anti-malarial, anti-TB, anti-fungal, anti-inflammatory, ant-goat etc. In vitro, toxicological study of novel synthesized compound.

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Mr. Dnyanadeo J. Kesarkar
(Research Scholar)
Department of chemistry
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Mahavidyalaya Udgir
Latur- 413517

Dr. Baliram S. Hote
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